

**UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056**

In the matter of the petition of

Raytheon Systems Company

for an exemption from § 25.815 of Title 14,
Code of Federal Regulations

Regulatory Docket No. 29778

PARTIAL GRANT OF EXEMPTION

By letters dated September 30, 1999, Mr. Paul Sallas, Manager, Designate Alteration Station, Raytheon Systems Company, Intelligence, Information and Aircraft Integration Systems, P.O. Box 1544580, Waco, TX 76715-4580, petitioned for an exemption from the requirements of § 25.815 of Title 14, Code of Federal Regulations (14 CFR). The proposed exemption, if granted, would permit a movement of passenger seats into the required aisle space under certain circumstances on a Boeing 737-700 Increased Gross Weight (IGW) airplane.

The petitioner requests relief from the following regulations:

Section 25.815 - Requires that minimum main aisle width in the passenger cabin be provided for all phases of airplane operation.

The petitioner's supportive information is as follows:

“Statement of Issue:

“In the years just prior to the recodification of CAR 4b into FAR 25 the CAA issued NPRM 63-42 (28 FR 11507, October 23, 1963) which was proposed in an effort to achieve improved crashworthiness for Transport Category Airplanes. However, before

the conclusion of the public rulemaking process concerning these issues was complete, all of the former CAR 4b rules were recodified into FAR 25 on December 24, 1964 (29 FR 18289). Those rules were essentially those found in the former CAR 4b and did not incorporate any of the crashworthiness proposals of NPRM 63-42. However, shortly after this recodification, the FAA issued Amendment 25-1 (30 FR 3204, March 9, 1965) which incorporated NPRM 63-42 crashworthiness proposals originally intended for incorporation into CAR 4b.

“No change to § 25.815 was included in the crashworthiness measures incorporated by Amendment 25-1 nor was any proposed by NPRM 63-42. In fact, § 25.815 did not change again until Amendment 25-15 and has not changed subsequently since Amendment 25-38. The latter two amendments only affected some specific aisle width dimensions for aircraft having 19 or less passengers. The current rule reads as follows:

‘The passenger aisle width at any point between seats must equal or exceed the values in the following table:

Minimum passenger aisle width (inches)		
Passenger seating capacity	Less than 25 in. from floor	25 in. and more from floor

10 or less	^[1] 12	15
11 through 19	12	20
20 or more	15	20

‘Footnote:

^[1] A narrower width not less than 9 inches may be approved when substantiated by tests found necessary by the Administrator.

“The purpose of this rule is to prevent the reduction of aisle width for emergency egress below a value experience has shown to be acceptable for safe evacuation. That the intent of the rule is to limit aisle widths to certain minimum values as a safety measure for ‘emergency’ conditions is evident by the title of the major section of subpart D of part 25 within which § 25.815 is found. That section is entitled ‘EMERGENCY PROVISIONS.’ In light of the requirements for executive interiors in this Issue Paper [Raytheon] requests an exemption from FAR 25.815.

“This issue paper considers the desired configuration of a specific aircraft, referenced herein as DAS Project No. P-581, for the interior completion of a Boeing 737-700 IGW (BBJ) as an example of a typical executive interior arrangement requiring exemption from FAR 25.815 based on the BBJ’s intended use and operating limitations. A floorplan for DAS 10 SW’s Project P-581 showing the seats in the TTL [taxi, takeoff, and landing] positions as an attachment for reference.

“Applicant Position:

“The Boeing 737-700 IGW, referred to in the industry as the Boeing Business Jet or BBJ, is a derivative aircraft of earlier 737 models whose original airline configuration is being altered to accommodate a new special purpose. The special purpose for this model is ‘privately’ transporting very reduced numbers, usually less than 30% of the airplane’s capacity as used in an airline configuration, of executives on business or pleasure trips. The aircraft will be limited to part 91 and part 125 operations and will, therefore, be limited to ‘private use’. In considering the granting of this request, the Petitioner would accept an FAA requirement to exclude an airplane so configured from part 121 or part 135 operations.

“The Petitioner wishes to present a brief discussion of the § 25.815 aisle width issue that exists in the present floorplan. It should be stated at the outset that the condition described herein is common in many currently certified transport category airplanes having executive interiors and has been acknowledged by the FAA to exist. A frequent feature in such interiors is executive seating that is capable of tracking fore, aft, and laterally, swiveling, and reclining to varying degrees. In the process of such movements, the aisle widths required by § 25.815 can be temporarily violated. For TTL operations, placarding of such installations requires the seat backs to be rotated upward and the seats to be translated/swiveled into position so as to achieve the required aisle widths as defined by § 25.815. Some have argued that translating and swiveling a seat to its TTL position is acceptable but rotating a reclined seat to its TTL position is not strictly in compliance with § 25.815. However, the Petitioner believes that these procedures accompanied by appropriate placarding for translating, swiveling, and rotating a reclined seat back to its TTL position are collectively the same procedure and are acceptable in that each movement is simply a step in the entire process that insures compliance with the safety intent of § 25.815.

“The Petitioner believes that to comply with § 25.815 it must be substantiated that any egress path leading to a required emergency exit will not present aisle widths less than the values defined in § 25.815 under any taxi, takeoff, and landing (TTL) operation irrespective of the compartment configuration. Furthermore, the Petitioner believes that Advisory Circular 25.562-1A, Appendix 2, § 2. Seat Deformation, provides adequate guidance for compliance with §§ 25.561(d) and 25.562(c)(8) after the interior furnishings and seating have been subjected to the ultimate inertia forces listed in § 25.561(b) and the emergency landing dynamic conditions listed in § 25.562(b). Of course, this interpretation is not specifically stated in § 25.815 since the rule does not specify as to when the aisle width must meet the values listed in § 25.815. As a result, it has been asserted by some that these dimensions are to be maintained during all operations.

However, the Petitioner believes that there is precedence that the FAA has permitted deviation from these limits during certain flight operations in the past for airplanes equipped with executive interiors and, in the broader sense, a rational application of the rule as written would allow such exceptions. In fact, the aforementioned AC 25.562-1A reference specifically permits a 1.5-inch encroachment into the 20-inch aisle width limit owing to seat deformation after § 25.562 loads have been applied.

“As stated before, the mere fact that § 25.815 is under the general heading of ‘EMERGENCY PROVISIONS’ would lead one to believe that the prescribed aisle widths are specifically applicable for TTL operations because ‘emergency’ evacuation of occupants when the aircraft is actually in flight is clearly not envisioned. For example, it would not be unrealistic to expect a finding of non-compliance by the FAA if a seating arrangement were proposed that would meet the requirements of § 25.815 during all normal operations and, hence, before an emergency landing, but owing to excessive seat deformation or movement of the seat back as a result of § 25.562 loads, could not meet the guidance provided in AC 25.562-1A after emergency landing loads have been applied. Yet, § 25.815 does not speak to that issue. It would, however, be illogical to accept such a condition. The Petitioner believes the intent of the rule is to maintain a minimum acceptable aisle width after the imposition of the applicable loads and, therefore, during emergency evacuation. Hence, the importance of the aisle width limitations is, in fact, rationally understood by many to apply when it is needed rather than during all operations.

“Some insight may be gleaned relative to the interpretation of § 25.815 if we explore the limited guidance that is available in § 441.b. (1)-(4) of Advisory Circular 25-17 that speaks to compliance with the rule:

‘b. Guidance.

‘(1) The passenger aisle width is the normal distance between opposite seats measured without occupants. The distance should be determined without compression of seat fabric or cushion and with the seats or other aisle constraints in the most adverse position, such as seats reclined or broken over.

‘(2) When the measurement is not between seats but between other aisle constraints such as galleys, coat closets, storage compartments, etc., the minimum widths at the specified vertical distance above the floor still prevails. Protuberances such as door knobs, latches, rails, etc., should be considered if they encroach the specified aisle width. This measurement should be made using the vertical projection of any protuberance in its appropriate height zone (less than 25 inches from the floor or 25 inches and more from the floor). The effect of the protuberance on the evacuation of the airplane should be

considered when determining if it may or may not protrude into the required aisle width. Curtains may protrude slightly into the required aisle, provided the curtain and its tieback do not inhibit passage.

‘(3) For staggered seat rows, or zig zag aisles, the aisle width distance may be considered as that measured perpendicular to the aisle pathway at any point along its full path.

‘(4) Arm rests that swing up, such as those for handicapped persons, may encroach upon the 20 inch width in the up position. If so, the arm rest should automatically return to the down position or be appropriately placarded.’

“It has been argued by some that the last sentence of b.(1) clearly prohibits encroachment into the required aisle space by seats that are either reclined or broken over. However, that conclusion is not entirely consistent with the acceptable condition described only a few paragraphs later in b.(4) relative to armrests. In that situation, encroachment of the 20-inch aisle width by an armrest any time before TTL is deemed acceptable contingent upon either automatic return of the armrest or appropriate placarding. It seems to the Petitioner that the guidance stated in b.(1) may have been intended to prevent the potential for hazardous encroachment by a seat back after an emergency landing where forces may reposition it and compromise the aisle space. Also to be considered is the fact that FAA policy provided as recent as June 1999 permitted seats to be ‘tracked’ back to a takeoff and landing position prior to that phase of operation for the express purpose of meeting § 25.815. This, too, seems inconsistent with any prohibition to reposition a seat back for the same purpose. Therefore, the Petitioner is convinced that neither no such prohibition should exist nor does temporary encroachment into the prescribed aisle space prior to TTL compromise safety.

“A final consideration that should not be ignored relative to the issue of seat back encroachment into the required aisle space are the seat test structural requirements for orientation of the test article. If a seat has been qualified under § 25.562, the occupant position relative to direction of loads and seat back position has consequently been established by those tests as the approved TTL position. Since the rules do not prohibit the installation of seats that track, swivel, and recline, it must be assumed that, regardless of whether the seat may encroach upon aisle space or not, the seat installation design must include measures that would require the occupant or an attendant to orient the seat properly prior to TTL operations. Therefore, it is incumbent upon the airplane seat installer to assure that the prescribed seat orientation can be maintained during TTL operations and, in practice, it is customary for this requirement to be fulfilled either operationally, by appropriate placarding, or a combination of both.

“Having summarized the specific aisle width issues for the subject interior arrangement, the Petitioner proposes the following design measures, features, and discussion that, when considered in their totality, would result in a level of safety that adequately

addresses the intent of § 25.815 considering the intended use of the airplane. The ultimate intent of this rule is understood to be that an acceptable aisle width must be present, based on FAA experience, which permits safe evacuation in the event of an emergency landing. Neither that intent nor the required aisle width dimensions are at issue here. However, at issue is whether these aisle widths must be present at all times and during all operations. The Petitioner contends there is sufficient precedent to conclude, and sound logic would suggest, that the required aisle widths need only be present during TTL operations given also the relaxed aisle width limits permitted by Advisory Circular 25.562-1A, Appendix 2, § 2. Seat Deformation, for deformed seating. It is obvious that thousands of airline flights are conducted each day with the prescribed aisle width temporarily compromised by the presence of food carts, passengers, carry-on luggage, galley doors and drawers, armrests, and etc. that encroach into the aisle space yet there is no clamor within the FAA to prohibit such practices.

“To this end, the Petitioner proposes that the intent of § 25.815 can be achieved for this application and all other similar applications where this is at issue using the following the following alternate means of compliance:

“1. A placard must be installed in a conspicuous location on or adjacent to all seats whose encroachment into the aisle space required by § 25.815 is possible (by translation, swivel, and/or seat recline). The placard must contain concise passenger information requiring the seat and its back to be fully oriented to the required TTL position, which not only assures that the seat is in the proper orientation for which § 25.562 approval has been granted, but would also assure compliance with § 25.815.

“2. The seat occupant must be able to readily identify the proper TTL position for the seat by positive detents in the seat and/or seat track mechanisms.

“3. A pre-flight/landing briefing and briefing card is required of the operator to inform the passengers of proper seat orientation for TTL operation.

“Owing to the urgent nature of this action, the Petitioner requests FAA concurrence with the proposed compensating measures contained herein for the airplane modification defined by DAS Project P-581 and scheduled for delivery on or about October 4, 1999. The Petitioner has made a good faith effort to establish an acceptable means of compliance with § 25.815 fully one year prior to the date of this Petition and understood that an agreement was in place through policy guidance which included a requirement to comply only with the measures listed in items 1. through 3. above. However, approximately two weeks prior to this Petition, the applicant was verbally informed through ACO [Aircraft Certification Office] ASW-150 that the Transport Aircraft Directorate had reversed that agreement. The Petitioner contends that a delay in acting on this petition for exemption because of publication would be detrimental to the Petitioner. In light of the foregoing, the Petitioner requests immediate action by waiver of the publication requirement in accordance with 14 CFR Part 11, § 11.27(j)(3)(ii).

“Public Interest:

“Granting this Petition for Exemption is clearly in the public interest as it would permit the efficient and safe carriage of executives and Heads of State in an environment that would otherwise be impossible without this relief. The Petitioner’s arguments contained herein establish that by granting this Exemption the FAA can achieve both the Petitioners design requirements and the safety intent of subject regulations without serious compromise. The Petitioner contends that the relief requested in this Exemption is essential to growth in a world economy in which the United States must strive to remain a dominate force. It is further argued that the design feature described herein has heretofore otherwise been accepted by FAA policy, albeit unwritten, has not been considered a safety issue in the past, and in fact is a condition existing in many currently certified executive and Head of State transport airplane interiors.

“The Petitioner is one of the world’s leading interior modifiers of large transport category executive and Head of State airplanes, provides jobs for thousands of engineers, technicians, and subcontractors, and is committed to remaining the leading outfitter of large transport airplanes with executive interiors. In light of the Petitioner’s preeminence in the field of aviation and the stated goal of the United States to remain dominant and competitive in aviation it is imperative that the Petitioner be granted the regulatory relief requested herein. Failure to achieve this goal will result in immeasurable loss of domestic and foreign trade for the United States, the Petitioner, and the intended operators of these airplanes. A casual survey of industry publications will reveal that completions for executive transports by non-domestic modifiers frequently include features that would involve the condition discussed herein. If the petitioner fails to receive the requested relief, it is obvious that this business will leave our shores for a more favorable climate.

“In summary, it is therefore argued for the above stated reasons that the subject request for Exemption is in the Public interest.”

FAA’s Determination as to Need for Public Process

In accordance with 14 CFR 11.27(j)(3), the FAA finds that action on this petition need not be delayed by Federal Register publication and comment procedures for the following reasons: (1) The notice and opportunity for prior public comment are impracticable because those procedures would significantly delay issuance of the design approval and the delivery of the affected aircraft, and (2) Issuance of the exemption would not set a precedent. It has been determined that the FAA has approved transport category airplanes operated in private use that do not comply with the requirements of § 25.815.

The FAA's analysis/summary is as follows:

During the cabin safety workshop sponsored by the Transport Airplane Directorate (TAD) from August 25-28, 1998, it became clear that there has been a non-standardized approach to compliance with § 25.815. Some FAA offices permit seat backs to recline or

break over into the required aisle in private use (business/executive) airplanes. Also, some FAA offices accept seats that translate, pivot, or track to positions that intrude into the aisle. In some FAA offices, acceptable interior arrangements have the entire aisle blocked when seats are not in the taxi, takeoff, and landing position. Some FAA offices require that the seats that recline or break over into the aisle have placarding on the seats requiring the seat backs to be in the upright position for taxi, takeoff, and landing. The placarding is in lieu of positive design features that prevent such movement. The seats that translate, pivot, or track into positions that encroach into the minimum required aisle are placarded to be in a specific position for taxi, takeoff and landing that provides the required aisle width. Encroachment into the aisle during flight is allowed for private use airplanes, and the aisle width requirements of § 25.815 are only applied to the taxi, takeoff, and landing position of the seats.

These findings of compliance are contrary to the requirements of § 25.815. The regulation for width of aisle does not specify that the requirement only applies to taxi, takeoff, and landing position of seats. Therefore, the specified aisle width is required to be maintained during all phases of airplane operation.

Aisles are required to allow for rapid egress from the airplane in an emergency. They also provide the means for crewmembers to access all parts of the cabin during airplane operations to address emergency conditions. Additionally, they allow passengers to return to their seats during turbulence. Not providing adequate aisles during flight may prevent the accomplishment of the latter needs.

The regulation requires minimum aisle widths and, in the absence of exceptions in the rule, applies to all phases of flight, including taxi, takeoff, and landing. At the time the policy was developed for this rule, this requirement applied to all phases of flight.

This position notwithstanding, it has been determined that for some time the FAA has approved transport category airplanes operated in private use that do not comply with the requirements of § 25.815. These certifications have been in the form of supplemental type certificates (STC) and field approvals. Based on these FAA approvals, the companies installing interiors in private use airplanes have continued to offer and sell more configurations that do not comply with the requirements of § 25.815.

The FAA is giving great attention to the issue of transport category airplanes operated in private use. There are several regulatory requirements, including those relating to aisle width, for which it may be in the public interest to develop new criteria that take into account the differences between private use and air carrier operations. The FAA intends to summarize its views on these regulations and, ultimately, propose revisions to the requirements, where appropriate. Section 25.815, the subject of this petition for exemption may be included in those proposed revisions. If revised aisle width regulations are adopted, this may allow additional design flexibility when certain conditions are met. This general issue is not resolved at this time, however, and the particular airplane in question must be addressed on its own merits.

The petitioner's position was included in the Issue Paper that was part of the petition for exemption submitted by Raytheon Systems Company-Waco, for the Boeing Model 737-700 IGW, Project No. P-581 (DAS). The FAA has reproduced the applicant's position from the issue paper.

The petitioner identifies an executive interior arrangement for a Boeing 737-700 IGW airplane, known in industry as the Boeing Business Jet (BBJ). This interior arrangement has only 17 taxi, takeoff, and landing seats for passengers, while the type and number of exits installed would allow a theoretical maximum of 149 passengers. The 17 passengers and six passenger exits result in a very conservative interior arrangement from an evacuation standpoint.

The petitioner identifies the purpose of this airplane as "private" not to be operated for hire, or offered for common carriage. In addition, the passengers on the airplane will be very familiar with the interior arrangement of the airplane.

The petitioner identifies detrimental reliance on previous FAA approvals in requesting exemption from the intent of § 25.815, stating the proposed placarding and briefings provide an acceptable method of compliance for this type of airplane operation.

In consideration of the foregoing, I find that a partial grant of time limited exemption until October 1, 2004, is in the public interest and will not adversely affect the level of safety provided by the regulations. It is anticipated that, by this date, any regulatory revisions described previously will have been adopted, and will address future operations of the subject airplane. Therefore, pursuant to the authority contained in 49 U.S.C. 40113 and 44701, delegated to me by the Administrator (14 CFR § 11.53), the petition for exemption from the requirements of § 25.815, to allow a movement of passenger seats into the required aisle space under certain circumstances on the Boeing Model 737-700 IGW airplane defined in the Raytheon DAS Project P-581, is hereby granted until October 1, 2004, with the following provisions:

1. The required aisle dimensions of § 25.815 must be maintained during taxi, takeoff, and landing.
2. Each seat and combination of seats moved from the taxi, takeoff, and landing position that encroaches into the aisle space required by § 25.815 must be conspicuously placarded. The placards must clearly convey to the passengers how and when to return the seats to positions approved for taxi, takeoff, and landing, when instructed by the flightcrew in the event of an inflight emergency or turbulence, as well as during taxi, takeoff, and landing. The placards may convey the information in pictorial form or in English.
3. Each seat and combination of seats moved from the taxi, takeoff, and landing position that encroaches into the aisle space required by § 25.815 must be equipped with a readily accessible briefing card. The cards must pictorially convey to the passengers how to return the seats to positions approved for taxi, takeoff, and landing, when instructed by

the flightcrew in the event of an inflight emergency or turbulence, as well as during taxi, takeoff, and landing.

4. The applicant must demonstrate that the seat occupant is able to readily identify and comply with the proper taxi, takeoff, and landing position for the seat.

5. The airplane must not be operated for hire, or offered for common carriage. (This provision does not preclude the operator from receiving remuneration to the extent consistent with 14 CFR part 125 and 14 CFR part 91, subpart F, as applicable.). The following text must be incorporated into the supplemental type certificate (STC): “The interior configuration approved by this STC utilizes Exemption No. 7028, which prohibits the airplane from being operated for hire, or offered for common carriage.”

6. The airplane is operated with oral preflight and prelanding briefings of the passengers by a trained crewmember instructing them to return the movable tables and seats to their approved taxi, takeoff, and landing positions in the event of an inflight emergency or turbulence as well as during taxi, takeoff, and landing, as identified by the placards and briefing cards. This procedure must be incorporated into the normal procedures section of the Airplane Flight Manual (AFM).

7. When the flightcrew determines that transiting the aisle is necessary either to address an emergency or to enable passengers to return to their seats during turbulence, they shall instruct passengers to return their seats to the approved taxi, takeoff, and landing position. This procedure must be incorporated into the normal and emergency procedures sections of the Airplane Flight Manual (AFM).

8. The operator must implement a procedure to ensure that the seats are in their approved taxi, takeoff, and landing position prior to taxi and takeoff, prior to landing, and whenever the passengers are instructed to do so during the flight. This procedure must be incorporated into the normal and emergency procedures sections of the Airplane Flight Manual (AFM).

NOTE: This partial grant of exemption expires October 1, 2004.

Issued in Renton, Washington, on October 7, 1999.

/s/ John J. Hickey
Manager, Transport Airplane Directorate
Aircraft Certification Service, ANM-100